



SEQUENCE LISTING

Laub, Ruth
Di Giambattista, Mario

<120> ANTIGENIC POLYPEPTIDE SEQUENCE OF FACTOR
VIII, FRAGMENTS AND/OR EPITOPES OF THESE SEQUENCES

<130> VANMA48.001CP1

<140> US 09/853,080

<141> 2001-05-09

<150> US 08/765,837

<151> 1999-09-07

<150> PCT/BE95/00068

<151> 1995-07-14

<150> BE 940066

<151> 1994-07-14

<160> 49

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 17

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Arg 1648 to Tyr 1664 of A3 domain of
Factor VIII

<400> 1

Arg Asp Ile Thr Arg Thr Thr Leu Gln Ser Asp Gln Glu Glu Ile Asp

1

5

10

15

Tyr

<210> 2

<211> 16

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Asp 1681 to Arg 1696 of A3 domain of
Factor VIII

<400> 2

Asp Glu Asp Glu Asn Gln Ser Pro Arg Ser Phe Gln Lys Lys Thr Arg

1

5

10

15

<210> 3

<211> 10

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Thr 1739 to Tyr 1748 of A3 domain of
Factor VIII

<400> 3

Thr Asp Gly Ser Phe Thr Gln Pro Leu Tyr

1

5

10

<210> 4

<211> 9

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Asn 1777 to Phe 1785 of A3 domain of
Factor VIII

<400> 4

Asn Gln Ala Ser Arg Pro Tyr Ser Phe

1

5

<210> 5

<211> 22

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Glu 1794 to Tyr 1815 of A3 domain of
Factor VIII

<400> 5

Glu Asp Gln Arg Gln Gly Ala Glu Pro Arg Lys Asn Phe Val Lys Pro

1

5

10

15

Asn Glu Thr Lys Thr Tyr

20

<210> 6

<211> 9

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Met 1823 to Asp 1831 of A3 domain of
Factor VIII

<400> 6
Met Ala Pro Thr Lys Asp Glu Phe Asp
1 5

<210> 7
<211> 7
<212> PRT
<213> Homo sapiens

<220>
<223> epitope Glu 1885 to Phe 1891 of A3 domain of
Factor VIII

<400> 7
Glu Thr Lys Ser Trp Tyr Phe
1 5

<210> 8
<211> 16
<212> PRT
<213> Homo sapiens

<220>
<223> epitope Glu 1885 to Ala 1901 of A3 domain of
Factor VIII

<400> 8
Glu Thr Lys Ser Trp Phe Thr Glu Asn Met Glu Arg Asn Cys Arg Ala
1 5 10 15

<210> 9
<211> 9
<212> PRT
<213> Homo sapiens

<220>
<223> epitope Asp 1909 to Arg 1917 of A3 domain of
Factor VIII

<400> 9
Asp Pro Thr Phe Lys Glu Asn Tyr Arg
1 5

<210> 10
<211> 14
<212> PRT
<213> Homo sapiens

<220>
<223> epitope Ser 2018 to His 2031 of A3 domain of

Factor VIII

<400> 10

Ser Asn Lys Cys Gln Thr Pro Leu Gly Met Ala Ser Gly His
1 5 10

<210> 11

<211> 21

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Ala 108 to Val 128 of A1 domain of Factor
VIII

<400> 11

Ala Ser Glu Gly Ala Glu Tyr Asp Asp Gln Thr Ser Gln Arg Glu Lys
1 5 10 15
Glu Asp Asp Lys Val
20

<210> 12

<211> 12

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Glu 181 to Leu 192 of A1 domain of Factor
VIII

<400> 12

Glu Gly Ser Leu Ala Lys Glu Lys Thr Gln Thr Leu
1 5 10

<210> 13

<211> 25

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Asp 203 to Ala 227 of A1 domain of Factor
VIII

<400> 13

Asp Glu Gly Lys Ser Trp His Ser Glu Thr Lys Asn Ser Leu Met Gln
1 5 10 15
Asp Arg Asp Ala Ala Ser Ala Arg Ala
20 25

<210> 14

<211> 29

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Asp 327 to Met 355 of A1 domain of Factor
VIII

<400> 14

Asp	Ser	Cys	Pro	Glu	Glu	Pro	Gln	Leu	Arg	Met	Lys	Asn	Asn	Glu	Glu
1				5					10					15	
Ala	Glu	Asp	Tyr	Asp	Asp	Asp	Leu	Thr	Asp	Ser	Glu	Met			
			20				25								

<210> 15

<211> 23

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Asp 403 to Lys 425 of A2 domain of Factor
VIII

<400> 15

Asp	Asp	Arg	Ser	Tyr	Lys	Ser	Gln	Tyr	Leu	Asn	Asn	Gly	Pro	Gln	Arg
1				5					10					15	
Ile	Gly	Arg	Lys	Tyr	Lys	Lys									
			20												

<210> 16

<211> 11

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Val 517 to Arg 527 of A2 domain of Factor
VIII

<400> 16

Val	Glu	Asp	Gly	Pro	Thr	Lys	Ser	Asp	Pro	Arg
1				5					10	

<210> 17

<211> 11

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Tyr 555 to Gln 565 of A2 domain of Factor
VIII

<400> 17

Tyr Lys Glu Ser Val Asp Gly Arg Gly Asn Gln

1

5

10

<210> 18

<211> 9

<212> PRT

<213> Homo sapiens

<220>

<223> epitope His 693 to Gly 701 of A2 domain of Factor
VIII

<400> 18

His Asn Ser Asp Phe Arg Asn Arg Gly

1

5

<210> 19

<211> 16

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Ser 710 to Asp 725 of A2 domain of Factor
VIII

<400> 19

Ser Cys Asp Lys Asn Thr Gly Asp Tyr Tyr Gly Asp Ser Tyr Glu Asp

1

5

10

15

<210> 20

<211> 12

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Leu 730 to Ser 741 of A2 domain of Factor
VIII

<400> 20

Leu Leu Ser Lys Asn Asn Ala Ile Glu Pro Arg Ser

1

5

10

<210> 21

<211> 13

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Ser 817 to Ser 830 of A2 domain of Factor
VIII

<400> 21

Ser Asp Asp Pro Ser Gly Ala Ile Asp Ser Asn Asn Ser
1 5 10

<210> 22

<211> 15

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Ile 2081 to Ser 2095 of C domain of Factor
VIII

<400> 22

Ile His Gly Ile Lys Thr Gln Gly Ala Arg Gln Lys Phe Ser Ser
1 5 10 15

<210> 23

<211> 17

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Tyr 2105 to Gly 2121 of C domain of Factor
VIII

<400> 23

Tyr Ser Leu Asp Gly Lys Lys Trp Gln Thr Tyr Arg Gly Asn Ser Thr
1 5 10 15
Gly

<210> 24

<211> 10

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Asn 2128 to Asn 2138 of C domain of Factor
VIII

<400> 24

Asn Val Asp Ser Ser Gly Ile Lys His Asn
1 5 10

<210> 25

<211> 12

<212> PRT

<213> Homo sapiens

<220>

<223> epitope His 2152 to Arg 2163 of C domain of Factor

VIII

<400> 25

His Pro Thr His Tyr Ser Ile Arg Ser Thr Leu Arg
1 5 10

<210> 26

<211> 17

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Ser 2181 to Asn 2198 of C domain of Factor
VIII

<400> 26

Ser Lys Ala Ile Ser Asp Ala Gln Ile Thr Ala Ser Ser Tyr Phe Thr
1 5 10 15
Asn

<210> 27

<211> 19

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Ser 2204 to Gln 2222 of C domain of Factor
VIII

<400> 27

Ser Pro Ser Lys Ala Arg Leu His Leu Gln Gly Arg Ser Asn Ala Trp
1 5 10 15
Arg Pro Gln

<210> 28

<211> 17

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Gln 2235 to Leu 2251 of C domain of Factor
VIII

<400> 28

Gln Lys Thr Met Lys Val Thr Gly Val Thr Thr Gln Gly Val Lys Ser
1 5 10 15
Leu

<210> 29
<211> 10
<212> PRT
<213> Homo sapiens

<220>
<223> epitope Gly 2242 to Leu 2251 of C domain of Factor
VIII

<400> 29
Gly Val Thr Thr Gln Gly Val Lys Ser Leu
1 5 10

<210> 30
<211> 9
<212> PRT
<213> Homo sapiens

<220>
<223> epitope Ile 2262 to Gln 2270 of C domain of Factor
VIII

<400> 30
Ile Ser Ser Ser Gln Asp Gly His Gln
1 5

<210> 31
<211> 17
<212> PRT
<213> Homo sapiens

<220>
<223> epitope Leu 2273 to Ser 2289 of C domain of Factor
VIII

<400> 31
Leu Phe Phe Gln Asn Gly Lys Val Lys Val Phe Gln Gly Asn Gln Asp
1 5 10 15
Ser

<210> 32
<211> 14
<212> PRT
<213> Homo sapiens

<220>
<223> epitope Pro 2292 to Tyr 2305 of C domain of Factor
VIII

<400> 32
Pro Val Val Asn Ser Leu Asp Pro Pro Leu Leu Thr Arg Tyr

1

5

10

<210> 33

<211> 11

<212> PRT

<213> Homo sapiens

<220>

<223> epitope Glu 2322 to Tyr 2332 of C domain of Factor
VIII

<400> 33

Glu Val Leu Gly Cys Glu Ala Gln Asp Leu Tyr

1

5

10

<210> 34

<211> 4

<212> PRT

<213> Homo sapiens

<400> 34

Arg Asp Ile Thr

1

<210> 35

<211> 4

<212> PRT

<213> Homo sapiens

<400> 35

Asp Glu Asp Glu

1

<210> 36

<211> 4

<212> PRT

<213> Homo sapiens

<400> 36

Pro Tyr Ser Phe

1

<210> 37

<211> 3

<212> PRT

<213> Homo sapiens

<400> 37

Glu Asp Gln

1

<210> 38
<211> 9
<212> PRT
<213> Homo sapiens

<400> 38
Glu Asp Gln Arg Gln Gly Ala Glu Pro
1 5

<210> 39
<211> 7
<212> PRT
<213> Homo sapiens

<400> 39
Gly Thr Lys Ser Trp Phe Thr
1 5

<210> 40
<211> 3
<212> PRT
<213> Homo sapiens

<400> 40
Cys Arg Ala
1

<210> 41
<211> 9
<212> PRT
<213> Homo sapiens

<400> 41
Asp Arg Asp Ala Ala Ser Ala Arg Ala
1 5

<210> 42
<211> 8
<212> PRT
<213> Homo sapiens

<400> 42
Asp Asp Leu Thr Asp Ser Glu Met
1 5

<210> 43
<211> 4
<212> PRT

<213> Homo sapiens

<400> 43

Asp Asp Arg Ser

1

<210> 44

<211> 4

<212> PRT

<213> Homo sapiens

<400> 44

Ile His Gly Ile

1

<210> 45

<211> 3

<212> PRT

<213> Homo sapiens

<400> 45

Tyr Ser Leu

1

<210> 46

<211> 3

<212> PRT

<213> Homo sapiens

<400> 46

Phe Thr Asn

1

<210> 47

<211> 4

<212> PRT

<213> Homo sapiens

<400> 47

Val Lys Ser Leu

1

<210> 48

<211> 3

<212> PRT

<213> Homo sapiens

<400> 48

Thr Arg Tyr

1

```
<220>  
<221> SIGNAL  
<222> (1) ... (19)
```

Met	Gln	Ile	Glu	Leu	Ser	Thr	Cys	Phe	Phe	Leu	Cys	Leu	Leu	Arg	Phe
				-15					-10					-5	
Cys	Phe	Ser	Ala	Thr	Arg	Arg	Tyr	Tyr	Leu	Gly	Ala	Val	Glu	Leu	Ser
			1				5					10			
Trp	Asp	Tyr	Met	Gln	Ser	Asp	Leu	Gly	Glu	Leu	Pro	Val	Asp	Ala	Arg
	15					20					25				
Phe	Pro	Pro	Arg	Val	Pro	Lys	Ser	Phe	Pro	Phe	Asn	Thr	Ser	Val	Val
30					35					40					45
Tyr	Lys	Lys	Thr	Leu	Phe	Val	Glu	Phe	Thr	Asp	His	Leu	Phe	Asn	Ile
				50					55					60	
Ala	Lys	Pro	Arg	Pro	Pro	Trp	Met	Gly	Leu	Leu	Gly	Pro	Thr	Ile	Gln
			65					70					75		
Ala	Glu	Val	Tyr	Asp	Thr	Val	Val	Ile	Thr	Leu	Lys	Asn	Met	Ala	Ser
		80					85					90			
His	Pro	Val	Ser	Leu	His	Ala	Val	Gly	Val	Ser	Tyr	Trp	Lys	Ala	Ser
	95					100					105				
Glu	Gly	Ala	Glu	Tyr	Asp	Asp	Gln	Thr	Ser	Gln	Arg	Glu	Lys	Glu	Asp
110					115					120					125
Asp	Lys	Val	Phe	Pro	Gly	Gly	Ser	His	Thr	Tyr	Val	Trp	Gln	Val	Leu
				130					135					140	
Lys	Glu	Asn	Gly	Pro	Met	Ala	Ser	Asp	Pro	Leu	Cys	Leu	Thr	Tyr	Ser
			145					150					155		
Tyr	Leu	Ser	His	Val	Asp	Leu	Val	Lys	Asp	Leu	Asn	Ser	Gly	Leu	Ile
		160					165					170			
Gly	Ala	Leu	Leu	Val	Cys	Arg	Glu	Gly	Ser	Leu	Ala	Lys	Glu	Lys	Thr
	175					180					185				
Gln	Thr	Leu	His	Lys	Phe	Ile	Leu	Leu	Phe	Ala	Val	Phe	Asp	Glu	Gly
190					195					200					205
Lys	Ser	Trp	His	Ser	Glu	Thr	Lys	Asn	Ser	Leu	Met	Gln	Asp	Arg	Asp
				210					215					220	
Ala	Ala	Ser	Ala	Arg	Ala	Trp	Pro	Lys	Met	His	Thr	Val	Asn	Gly	Tyr
			225					230					235		
Val	Asn	Arg	Ser	Leu	Pro	Gly	Leu	Ile	Gly	Cys	His	Arg	Lys	Ser	Val
		240					245					250			
Tyr	Trp	His	Val	Ile	Gly	Met	Gly	Thr	Thr	Pro	Glu	Val	His	Ser	Ile
	255					260					265				
Phe	Leu	Glu	Gly	His	Thr	Phe	Leu	Val	Arg	Asn	His	Arg	Gln	Ala	Ser
270					275					280					285
Leu	Glu	Ile	Ser	Pro	Ile	Thr	Phe	Leu	Thr	Ala	Gln	Thr	Leu	Leu	Met
				290					295					300	
Asp	Leu	Gly	Gln	Phe	Leu	Leu	Phe	Cys	His	Ile	Ser	Ser	His	Gln	His
			305					310					315		
Asp	Gly	Met	Glu	Ala	Tyr	Val	Lys	Val	Asp	Ser	Cys	Pro	Glu	Glu	Pro

Ile	Glu	Lys	Thr	Asp	Pro	Trp	Phe	Ala	His	Arg	Thr	Pro	Met	Pro	Lys		
				770					775						780		
Ile	Gln	Asn	Val	Ser	Ser	Ser	Asp	Leu	Leu	Met	Leu	Leu	Arg	Gln	Ser		
			785					790					795				
Pro	Thr	Pro	His	Gly	Leu	Ser	Leu	Ser	Asp	Leu	Gln	Glu	Ala	Lys	Tyr		
		800					805					810					
Glu	Thr	Phe	Ser	Asp	Asp	Pro	Ser	Pro	Gly	Ala	Ile	Asp	Ser	Asn	Asn		
	815					820					825						
Ser	Leu	Ser	Glu	Met	Thr	His	Phe	Arg	Pro	Gln	Leu	His	His	Ser	Gly		
830					835					840					845		
Asp	Met	Val	Phe	Thr	Pro	Glu	Ser	Gly	Leu	Gln	Leu	Arg	Leu	Asn	Glu		
			850						855					860			
Lys	Leu	Gly	Thr	Thr	Ala	Ala	Thr	Glu	Leu	Lys	Lys	Leu	Asp	Phe	Lys		
		865						870					875				
Val	Ser	Ser	Thr	Ser	Asn	Asn	Leu	Ile	Ser	Thr	Ile	Pro	Ser	Asp	Asn		
	880						885					890					
Leu	Ala	Ala	Gly	Thr	Asp	Asn	Thr	Ser	Ser	Leu	Gly	Pro	Pro	Ser	Met		
	895					900					905						
Pro	Val	His	Tyr	Asp	Ser	Gln	Leu	Asp	Thr	Thr	Leu	Phe	Gly	Lys	Lys		
910					915					920					925		
Ser	Ser	Pro	Leu	Thr	Glu	Ser	Gly	Gly	Pro	Leu	Ser	Leu	Ser	Glu	Glu		
			930						935					940			
Asn	Asn	Asp	Ser	Lys	Leu	Leu	Glu	Ser	Gly	Leu	Met	Asn	Ser	Gln	Glu		
		945						950					955				
Ser	Ser	Trp	Gly	Lys	Asn	Val	Ser	Ser	Thr	Glu	Ser	Gly	Arg	Leu	Phe		
		960					965					970					
Lys	Gly	Lys	Arg	Ala	His	Gly	Pro	Ala	Leu	Leu	Thr	Lys	Asp	Asn	Ala		
	975					980					985						
Leu	Phe	Lys	Val	Ser	Ile	Ser	Leu	Leu	Lys	Thr	Asn	Lys	Thr	Ser	Asn		
990					995					1000					1005		
Asn	Ser	Ala	Thr	Asn	Arg	Lys	Thr	His	Ile	Asp	Gly	Pro	Ser	Leu	Leu		
			1010						1015					1020			
Ile	Glu	Asn	Ser	Pro	Ser	Val	Trp	Gln	Asn	Ile	Leu	Glu	Ser	Asp	Thr		
		1025						1030					1035				
Glu	Phe	Lys	Lys	Val	Thr	Pro	Leu	Ile	His	Asp	Arg	Met	Leu	Met	Asp		
	1040						1045					1050					
Lys	Asn	Ala	Thr	Ala	Leu	Arg	Leu	Asn	His	Met	Ser	Asn	Lys	Thr	Thr		
	1055					1060					1065						
Ser	Ser	Lys	Asn	Met	Glu	Met	Val	Gln	Gln	Lys	Lys	Glu	Gly	Pro	Ile		
1070					1075					1080					1085		
Pro	Pro	Asp	Ala	Gln	Asn	Pro	Asp	Met	Ser	Phe	Phe	Lys	Met	Leu	Phe		
			1090						1095					1100			
Leu	Pro	Glu	Ser	Ala	Arg	Trp	Ile	Gln	Arg	Thr	His	Gly	Lys	Asn	Ser		
		1105						1110					1115				
Leu	Asn	Ser	Gly	Gln	Gly	Pro	Ser	Pro	Lys	Gln	Leu	Val	Ser	Leu	Gly		
	1120						1125					1130					
Pro	Glu	Lys	Ser	Val	Glu	Gly	Gln	Asn	Phe	Leu	Ser	Glu	Lys	Asn	Lys		
	1135					1140					1145						
Val	Val	Val	Gly	Lys	Gly	Glu	Phe	Thr	Lys	Asp	Val	Gly	Leu	Lys	Glu		
1150					1155					1160					1165		
Met	Val	Phe	Pro	Ser	Ser	Arg	Asn	Leu	Phe	Leu	Thr	Asn	Leu	Asp	Asn		
			1170						1175					1180			
Leu	His	Glu	Asn	Asn	Thr	His	Asn	Gln	Glu	Lys	Lys	Ile	Gln	Glu	Glu		
			1185					1190					1195				
Ile	Glu	Lys	Lys	Glu	Thr	Leu	Ile	Gln	Glu	Asn	Val	Val	Leu	Pro	Gln		

1200	1205	1210
Ile His Thr Val Thr Gly	Thr Lys Asn Phe Met	Lys Asn Leu Phe Leu
1215	1220	1225
Leu Ser Thr Arg Gln Asn Val Glu Gly Ser Tyr Asp Gly Ala Tyr Ala		
1230	1235	1240 1245
Pro Val Leu Gln Asp Phe Arg Ser Leu Asn Asp Ser Thr Asn Arg Thr		
1250	1255	1260
Lys Lys His Thr Ala His Phe Ser Lys Lys Gly Glu Glu Glu Asn Leu		
1265	1270	1275
Glu Gly Leu Gly Asn Gln Thr Lys Gln Ile Val Glu Lys Tyr Ala Cys		
1280	1285	1290
Thr Thr Arg Ile Ser Pro Asn Thr Ser Gln Gln Asn Phe Val Thr Gln		
1295	1300	1305
Arg Ser Lys Arg Ala Leu Lys Gln Phe Arg Leu Pro Leu Glu Glu Thr		
1310	1315	1320 1325
Glu Leu Glu Lys Arg Ile Ile Val Asp Asp Thr Ser Thr Gln Trp Ser		
1330	1335	1340
Lys Asn Met Lys His Leu Thr Pro Ser Thr Leu Thr Gln Ile Asp Tyr		
1345	1350	1355
Asn Glu Lys Glu Lys Gly Ala Ile Thr Gln Ser Pro Leu Ser Asp Cys		
1360	1365	1370
Leu Thr Arg Ser His Ser Ile Pro Gln Ala Asn Arg Ser Pro Leu Pro		
1375	1380	1385
Ile Ala Lys Val Ser Ser Phe Pro Ser Ile Arg Pro Ile Tyr Leu Thr		
1390	1395	1400 1405
Arg Val Leu Phe Gln Asp Asn Ser Ser His Leu Pro Ala Ala Ser Tyr		
1410	1415	1420
Arg Lys Lys Asp Ser Gly Val Gln Glu Ser Ser His Phe Leu Gln Gly		
1425	1430	1435
Ala Lys Lys Asn Asn Leu Ser Leu Ala Ile Leu Thr Leu Glu Met Thr		
1440	1445	1450
Gly Asp Gln Arg Glu Val Gly Ser Leu Gly Thr Ser Ala Thr Asn Ser		
1455	1460	1465
Val Thr Tyr Lys Lys Val Glu Asn Thr Val Leu Pro Lys Pro Asp Leu		
1470	1475	1480 1485
Pro Lys Thr Ser Gly Lys Val Glu Leu Leu Pro Lys Val His Ile Tyr		
1490	1495	1500
Gln Lys Asp Leu Phe Pro Thr Glu Thr Ser Asn Gly Ser Pro Gly His		
1505	1510	1515
Leu Asp Leu Val Glu Gly Ser Leu Leu Gln Gly Thr Glu Gly Ala Ile		
1520	1525	1530
Lys Trp Asn Glu Ala Asn Arg Pro Gly Lys Val Pro Phe Leu Arg Val		
1535	1540	1545
Ala Thr Glu Ser Ser Ala Lys Thr Pro Ser Lys Leu Leu Asp Pro Leu		
1550	1555	1560 1565
Ala Trp Asp Asn His Tyr Gly Thr Gln Ile Pro Lys Glu Glu Trp Lys		
1570	1575	1580
Ser Gln Glu Lys Ser Pro Glu Lys Thr Ala Phe Lys Lys Lys Asp Thr		
1585	1590	1595
Ile Leu Ser Leu Asn Ala Cys Glu Ser Asn His Ala Ile Ala Ala Ile		
1600	1605	1610
Asn Glu Gly Gln Asn Lys Pro Glu Ile Glu Val Thr Trp Ala Lys Gln		
1615	1620	1625
Gly Arg Thr Glu Arg Leu Cys Ser Gln Asn Pro Pro Val Leu Lys Arg		
1630	1635	1640 1645

His	Gln	Arg	Glu	Ile	Thr	Arg	Thr	Thr	Leu	Gln	Ser	Asp	Gln	Glu	Glu		
				1650					1655					1660			
Ile	Asp	Tyr	Asp	Asp	Thr	Ile	Ser	Val	Glu	Met	Lys	Lys	Glu	Asp	Phe		
			1665					1670					1675				
Asp	Ile	Tyr	Asp	Glu	Asp	Glu	Asn	Gln	Ser	Pro	Arg	Ser	Phe	Gln	Lys		
			1680				1685					1690					
Lys	Thr	Arg	His	Tyr	Phe	Ile	Ala	Ala	Val	Glu	Arg	Leu	Trp	Asp	Tyr		
	1695					1700					1705						
Gly	Met	Ser	Ser	Ser	Pro	His	Val	Leu	Arg	Asn	Arg	Ala	Gln	Ser	Gly		
1710					1715				1720					1725			
Ser	Val	Pro	Gln	Phe	Lys	Lys	Val	Val	Phe	Gln	Glu	Phe	Thr	Asp	Gly		
			1730					1735					1740				
Ser	Phe	Thr	Gln	Pro	Leu	Tyr	Arg	Gly	Glu	Leu	Asn	Glu	His	Leu	Gly		
			1745				1750					1755					
Leu	Leu	Gly	Pro	Tyr	Ile	Arg	Ala	Glu	Val	Glu	Asp	Asn	Ile	Met	Val		
	1760					1765				1770							
Thr	Phe	Arg	Asn	Gln	Ala	Ser	Arg	Pro	Tyr	Ser	Phe	Tyr	Ser	Ser	Leu		
	1775				1780					1785							
Ile	Ser	Tyr	Glu	Glu	Asp	Gln	Arg	Gln	Gly	Ala	Glu	Pro	Arg	Lys	Asn		
1790				1795					1800					1805			
Phe	Val	Lys	Pro	Asn	Glu	Thr	Lys	Thr	Tyr	Phe	Trp	Lys	Val	Gln	His		
			1810					1815					1820				
His	Met	Ala	Pro	Thr	Lys	Asp	Glu	Phe	Asp	Cys	Lys	Ala	Trp	Ala	Tyr		
			1825				1830					1835					
Phe	Ser	Asp	Val	Asp	Leu	Glu	Lys	Asp	Val	His	Ser	Gly	Leu	Ile	Gly		
	1840					1845					1850						
Pro	Leu	Leu	Val	Cys	His	Thr	Asn	Thr	Leu	Asn	Pro	Ala	His	Gly	Arg		
	1855					1860				1865							
Gln	Val	Thr	Val	Gln	Glu	Phe	Ala	Leu	Phe	Phe	Thr	Ile	Phe	Asp	Glu		
1870				1875					1880					1885			
Thr	Lys	Ser	Trp	Tyr	Phe	Thr	Glu	Asn	Met	Glu	Arg	Asn	Cys	Arg	Ala		
			1890					1895					1900				
Pro	Cys	Asn	Ile	Gln	Met	Glu	Asp	Pro	Thr	Phe	Lys	Glu	Asn	Tyr	Arg		
			1905				1910					1915					
Phe	His	Ala	Ile	Asn	Gly	Tyr	Ile	Met	Asp	Thr	Leu	Pro	Gly	Leu	Val		
	1920					1925					1930						
Met	Ala	Gln	Asp	Gln	Arg	Ile	Arg	Trp	Tyr	Leu	Leu	Ser	Met	Gly	Ser		
	1935				1940					1945							
Asn	Glu	Asn	Ile	His	Ser	Ile	His	Phe	Ser	Gly	His	Val	Phe	Thr	Val		
1950				1955					1960					1965			
Arg	Lys	Lys	Glu	Glu	Tyr	Lys	Met	Ala	Leu	Tyr	Asn	Leu	Tyr	Pro	Gly		
			1970					1975					1980				
Val	Phe	Glu	Thr	Val	Glu	Met	Leu	Pro	Ser	Lys	Ala	Gly	Ile	Trp	Arg		
			1985				1990					1995					
Val	Glu	Cys	Leu	Ile	Gly	Glu	His	Leu	His	Ala	Gly	Met	Ser	Thr	Leu		
	2000					2005				2010							
Phe	Leu	Val	Tyr	Ser	Asn	Lys	Cys	Gln	Thr	Pro	Leu	Gly	Met	Ala	Ser		
	2015				2020					2025							
Gly	His	Ile	Arg	Asp	Phe	Gln	Ile	Thr	Ala	Ser	Gly	Gln	Tyr	Gly	Gln		
2030				2035					2040					2045			
Trp	Ala	Pro	Lys	Leu	Ala	Arg	Leu	His	Tyr	Ser	Gly	Ser	Ile	Asn	Ala		
			2050					2055					2060				
Trp	Ser	Thr	Lys	Glu	Pro	Phe	Ser	Trp	Ile	Lys	Val	Asp	Leu	Leu	Ala		
			2065				2070					2075					
Pro	Met	Ile	Ile	His	Gly	Ile	Lys	Thr	Gln	Gly	Ala	Arg	Gln	Lys	Phe		

2080					2085					2090					
Ser	Ser	Leu	Tyr	Ile	Ser	Gln	Phe	Ile	Ile	Met	Tyr	Ser	Leu	Asp	Gly
2095					2100					2105					
Lys	Lys	Trp	Gln	Thr	Tyr	Arg	Gly	Asn	Ser	Thr	Gly	Thr	Leu	Met	Val
2110					2115					2120					
Phe	Phe	Gly	Asn	Val	Asp	Ser	Ser	Gly	Ile	Lys	His	Asn	Ile	Phe	Asn
2130					2135					2140					
Pro	Pro	Ile	Ile	Ala	Arg	Tyr	Ile	Arg	Leu	His	Pro	Thr	His	Tyr	Ser
2145					2150					2155					
Ile	Arg	Ser	Thr	Leu	Arg	Met	Glu	Leu	Met	Gly	Cys	Asp	Leu	Asn	Ser
2160					2165					2170					
Cys	Ser	Met	Pro	Leu	Gly	Met	Glu	Ser	Lys	Ala	Ile	Ser	Asp	Ala	Gln
2175					2180					2185					
Ile	Thr	Ala	Ser	Ser	Tyr	Phe	Thr	Asn	Met	Phe	Ala	Thr	Trp	Ser	Pro
2190					2195					2200					
Ser	Lys	Ala	Arg	Leu	His	Leu	Gln	Gly	Arg	Ser	Asn	Ala	Trp	Arg	Pro
2210					2215					2220					
Gln	Val	Asn	Asn	Pro	Lys	Glu	Trp	Leu	Gln	Val	Asp	Phe	Gln	Lys	Thr
2225					2230					2235					
Met	Lys	Val	Thr	Gly	Val	Thr	Thr	Gln	Gly	Val	Lys	Ser	Leu	Leu	Thr
2240					2245					2250					
Ser	Met	Tyr	Val	Lys	Glu	Phe	Leu	Ile	Ser	Ser	Ser	Gln	Asp	Gly	His
2255					2260					2265					
Gln	Trp	Thr	Leu	Phe	Phe	Gln	Asn	Gly	Lys	Val	Lys	Val	Phe	Gln	Gly
2270					2275					2280					
Asn	Gln	Asp	Ser	Phe	Thr	Pro	Val	Val	Asn	Ser	Leu	Asp	Pro	Pro	Leu
2290					2295					2300					
Leu	Thr	Arg	Tyr	Leu	Arg	Ile	His	Pro	Gln	Ser	Trp	Val	His	Gln	Ile
2305					2310					2315					
Ala	Leu	Arg	Met	Glu	Val	Leu	Gly	Cys	Glu	Ala	Gln	Asp	Leu	Tyr	
2320					2325					2330					